

# Crisis Resource Management

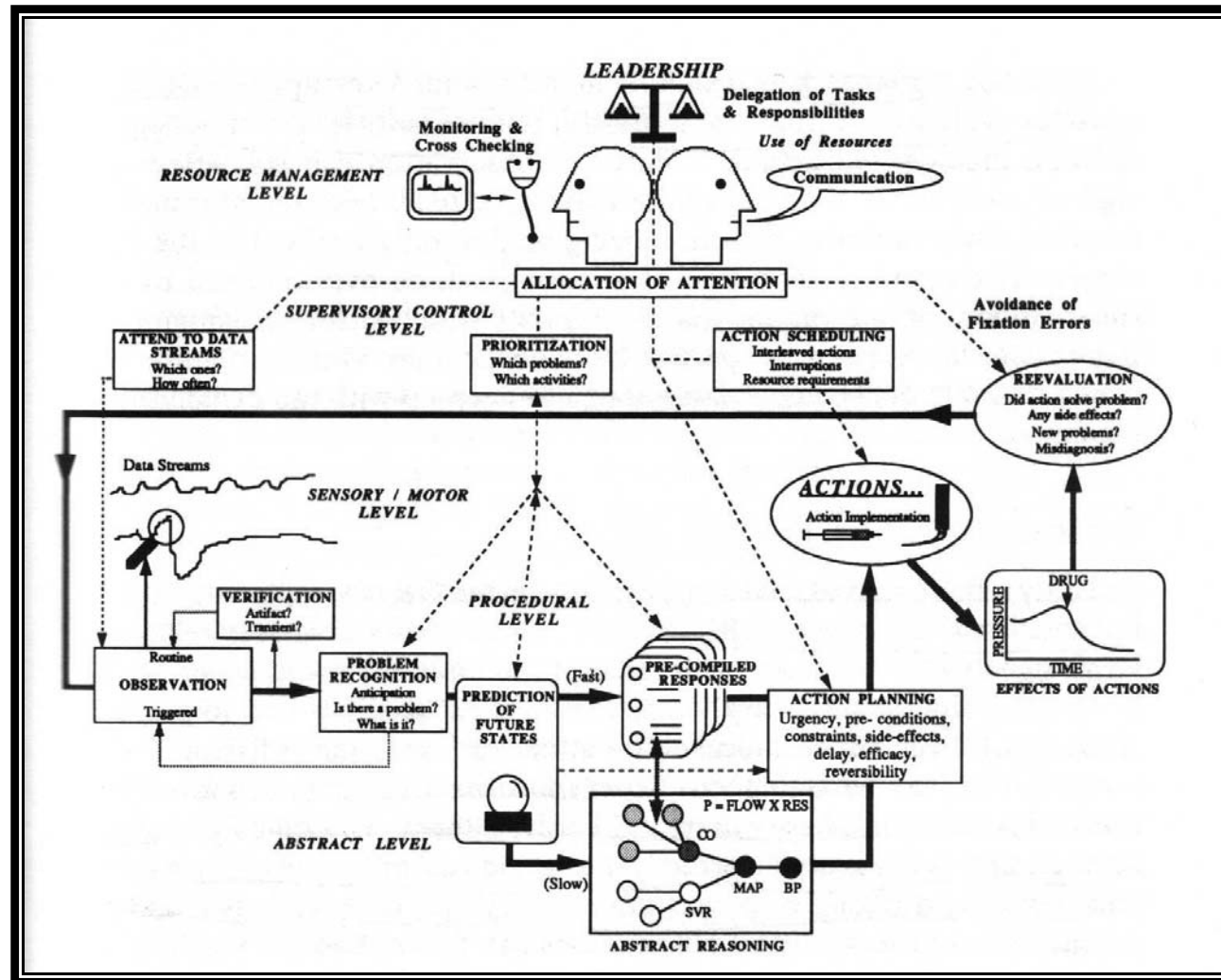
# Crisis Resource Management

Ability, during an emergency, to  
translate knowledge of what  
needs to be done into effective  
real world activity

# Resources

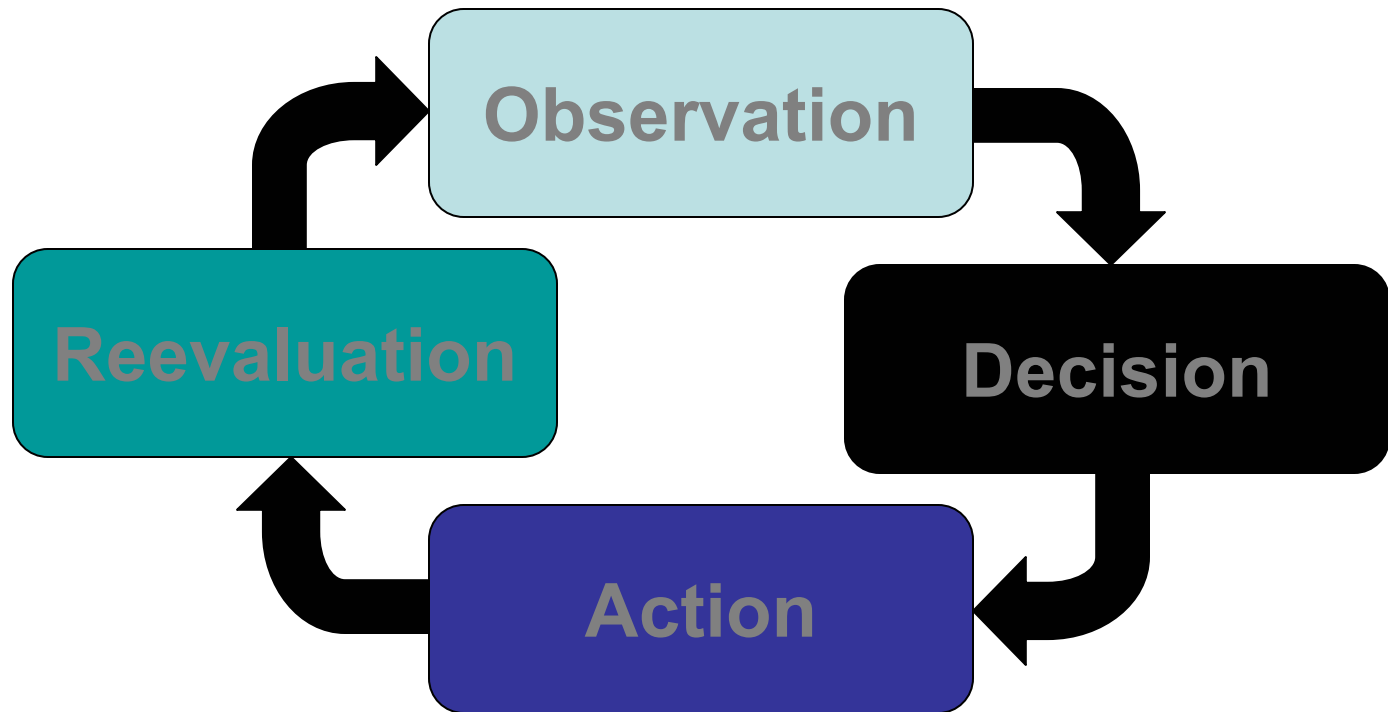
- Self
- Other personnel on scene
- Equipment
- Cognitive aids (checklists, manuals)
- External resources

# Incident Management Process



# Self-Management

# Core Cycle



# Observation

- Human close attention is limited to one or two items
- “Supervisory Control” must decide:
  - What information to attend to
  - How to observe it

# Observation

- Errors
  - Not observing
  - Not observing frequently enough
  - Not observing optimum data stream



# Observation

- Causes of Errors
  - Lack of vigilance (ability to sustain attention)
  - Failure to attend to all relevant information
  - Information overload

# Verification

- A change is observed
- Is it:
  - Significant?
  - An artifact (false data)?
  - A transient (true data--short duration)?

# Verification

- Repeat observation
- Observe a redundant channel
- Correlate multiple related variables (P, BP)
- Activate a new monitoring modality
- Recalibrate instrument/test its function
- Replace instrument with back-up
- Ask for a second opinion

# Problem Recognition

- Do observations indicate problem?
- What is its nature, importance?

*A common error is to observe problem signs but fail to recognize them as problematic*

# Problem Recognition

- Do cues observed match pattern known to represent a specific problem?
  - Yes?--Apply solution for that problem
  - No?--Apply heuristic (rule of thumb)

# Heuristics

- Generic Problems
  - “Too Fast, Too Slow, Absent”
  - “Difficulty with Ventilation”
  - “Inadequate Oxygenation”
  - “Hypoperfusion”

Generic Problems Allow Use of  
Generic Solutions to Buy Time

# Heuristics

- Frequency gambling
  - “If it eats hay and has hoofs, it’s probably a horse, not a zebra.”

# Heuristics

- Similarity matching
  - The situation more or less resembles one I've handled before
  - Therefore, I'll proceed like it is the same



# Dangers of Heuristics

- By definition, don't always work
- Ignore some information that is present
- Yield adequate, but not optimal decisions

# Advantages of Heuristics

- A good solution applied now may be better than a perfect solution applied later

**For example, after the  
patient is dead!**

# Prediction of Future States

- What will probably happen if...?
  - Influences priority given to problems
  - Common errors
    - Failure to predict evolution of a catastrophe
    - Failure to assign correct priorities during action planning

# Precompiled Responses

- Cue trigger predetermined/structured responses
- Allow for quick solutions to problems
- Can fail if problem:
  - Is not due to suspected cause
  - Does not respond to usual treatment

# Abstract Reasoning

- Essential when standard approaches not succeeding
- Can involve:
  - Searching for high level analogies
  - Deductive reasoning from deep knowledge base
- Can be time-consuming

# Action Implementation

- Sequencing
  - Actions must be prioritized, interleaved with concurrent activities
  - Considerations:
    - ◆ **Preconditions**
    - ◆ **Constraints**
    - ◆ **Side effects**
    - ◆ **Rapidity and ease**
    - ◆ **Certainty of success**
    - ◆ **Reversibility**
    - ◆ **Cost in attention/resources**

# Action Implementation

- Workload Management Strategies
  - Distributing work over time:
    - Pre-loading
    - Off-loading
    - Multiplexing
  - Distributing work over resources
  - Changing nature of task (altering standards of performance)

# Action Implementation

- Mental simulation of actions can help identify hidden flaws in plans
- If I do what I plan to do, what is going to happen?
  - Will it work?
  - Will it work, but will it create or complicate another problem?



# Reevaluation

- Did action have an effect?
- Is problem getting better or worse?
- Any side effects?
- Any problems we missed before?
- Was initial assessment/diagnosis correct?

# Reevaluation

**Essential to preventing  
“Fixation Errors”**

# Fixation Errors

- “*This And Only This*”
- Failure to revise plan, diagnosis despite evidence to contrary

# Fixation Errors

- “*Everything But This*”
- Failure to commit to definitive treatment of major problem

# Fixation Errors

- “*Everything’s OK*”
- Belief there is no problem in spite of evidence there is

# Fixation Errors

**“If everything is going so well,  
why isn't the patient getting  
better?”**

# Team Management

# Effective Team Decision-Making

- Situation Awareness
- Metacognition
- Shared Mental Models
- Resource Management



# Situation Awareness

- Recognizing decision must be made or action must be taken
  - Notice cues
  - Appreciate significance
    - What is risk?
    - Do we act now?
    - Do we watch, wait?
    - Are things going to deteriorate in future?

# Metacognition

- Determining overall plan, information needed to make decision
  - Thinking about thinking
  - Being reflective about:
    - What you're trying to do
    - How to do it
    - What additional information is needed
    - What results are likely to be

# Metacognition

- Stop and think
  - If we do this (or don't do it) what is likely to happen?
  - When is a decision good enough?

# Metacognition

- Teams that generate more contingency plans make fewer operational errors
- Effective teams emphasize strategies that kept options open
- Effective teams are sensitive to all sources of information that could solve problem

# Shared Mental Models

- Exploiting entire team's cognitive capabilities
- Assure all team members are solving same problem

# Shared Mental Models

- Strategies
  - Explicit discussion of problem
  - Closed loop communication
  - Volunteering necessary information
  - Requesting clarification
  - Providing reinforcement, feedback, confirmation

# Resource Management

- Assuring time, information, mental resources will be available when needed
  - Prioritize tasks
  - Allocate duties/delegate
  - Keep team leader free
  - Keep long enough time horizon to anticipate changes in workload

# Practical Crisis Management

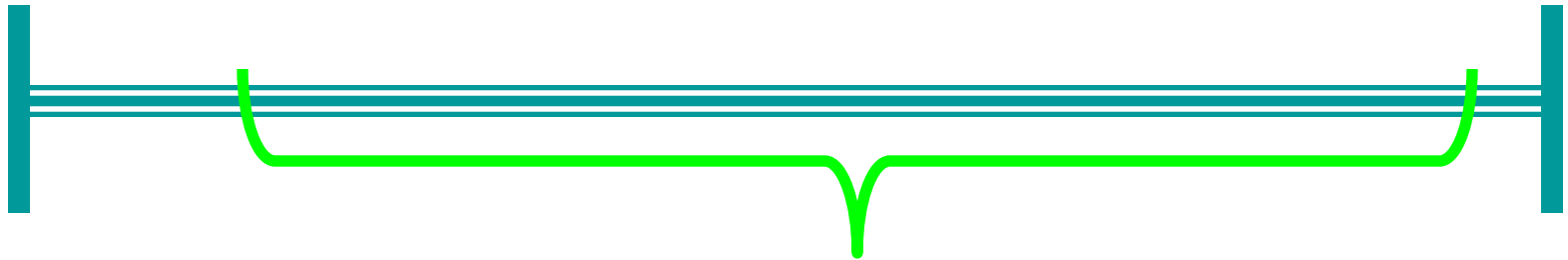


# Take Command

- Be sure everyone knows who is in charge
  - Decide what needs to be done
  - Prioritize necessary tasks
  - Assign tasks to specific individuals
- Control should be accomplished with full team participation
- Leader should be clearinghouse for information, suggestions

# Take Command

Laissez-faire   Democratic   Participative   Consultative   Autocratic



Range of Effective Teamwork

# Take Command

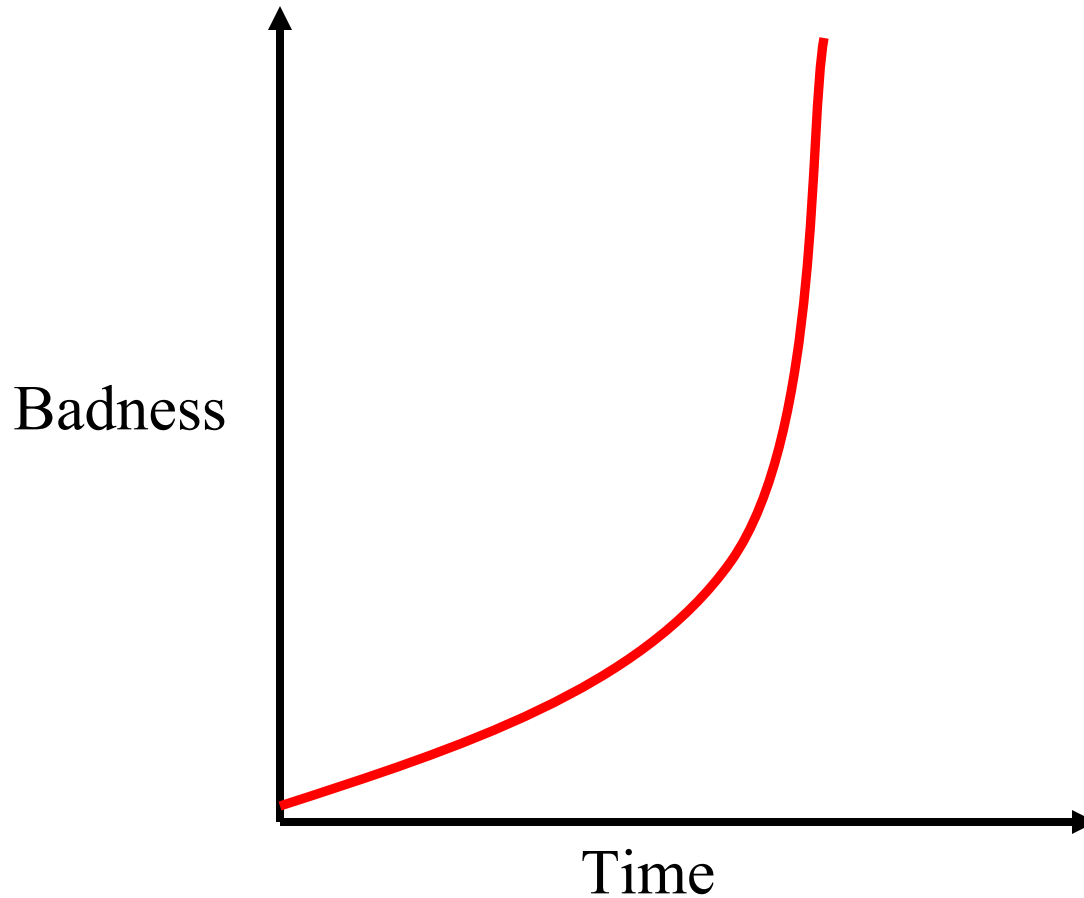
**“Authority with  
Participation”**

**“Assertiveness with  
Respect”**

# Declare Emergencies Early

Risks of **NOT** responding quickly  
usually far exceed risks of not doing  
so.

# Emergency Event Time-Severity Relationship Curve



# Good Communication = Good Teams

- Do **NOT** raise your voice
- If necessary ask for silence
- State requests clearly, precisely
- Avoid making statements into thin air
- Close the communication loop
- Listen to what people say regardless of job description or status

# Communicating Intent

- Here's what I think we face
- Here's what I think we should do
- Here's why
- Here's what we should keep our eye on
- Now, TALK TO ME

Good Communication = Good  
Teams

Concentrate on what is  
right for the patient rather  
than on who is right



# Distribute Workload

- Assign tasks according to people's skills
- Remain free to watch situation, direct team
- Look for overloads, performance failures

# Optimize Actions

- Escalate RAPIDLY to therapies with highest probability of success
- Never assume next action will solve problem
- Think of what you will do next if your actions do not succeed or cannot be implemented
- Think of consequences before acting

# Reassess--Reevaluate-- Repeatedly

- Any single data source may be wrong
- Cross-check redundant data streams
- Use **ALL** available data